GEORGIA INSTITUTE OF TECHNOLOGY — OFFICE OF CONTRACT ADMINISTRATION

PROJECT ADMINISTRATION DATA SHEET

[x] ORIGINAL [ ] REVISION NO. _____

Project No. E-19-511 — DATE 6/9/82

Project Director: Dr. R. F. Hochman NIH — School/Lab ChE

Sponsor: DHHS/PHS National Institute of Dental Research

Type Agreement: Grant No. 5-T32-DE07053-07

Award Period: From 7/1/82 To 6/30/83 (Performance) 9/30/83 (Reports)

Sponsor Amount: $81,876 (07 year) Contracted through: GTRI/GIT

Cost Sharing: _____

Title: Postdoctoral - Predoctoral Training in Dental Medicine

ADMINISTRATIVE DATA — OCA Contact Linda H. Bowman x4820

1) Sponsor Technical Contact:

Thomas M. Valega, Ph.D.
Chief Restorative Materials
Program Branch; Extramural Programs
NIDR; Public Health Service
Dept. of Health & Human Services
Bethesda, MD 20205
301-496-7491

2) Sponsor Admin/Contractual Matters:

Robert Ginsburg
Grants Management Officer
Extramural Programs
NIDR; Public Health Service
Dept. of Health and Human Services
Bethesda, MD 20205
301-496-7437

Defense Priority Rating: none — Security Classification: none

RESTRICTIONS

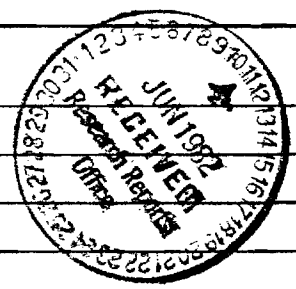
See Attached NIH Supplemental Information Sheet for Additional Requirements.

Travel: Foreign travel must have prior approval -- Contact OCA in each case. Domestic travel requires sponsor approval where total will exceed greater of $500 or 125% of approved proposal budget category.

Equipment: Title vests with GIT; however, we are accountable for all equipment purchased.

COMMENTS:

Continuation of E-19-507



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Project File
Other _____

GEORGIA INSTITUTE OF TECHNOLOGY OFFICE OF CONTRACT ADMINISTRATION

SPONSORED PROJECT TERMINATION/CLOSEOUT SHEET

Date April 26, 1984

Project No. E-19-511 School/~~Lab~~ ChE

Includes Subproject No.(s) _____

Project Director(s) Dr. Hochman ~~GTRI~~ / GIT

Sponsor DHHS/PHS/National Institute of Dental Research

Title Postdoctoral - Predoctoral Training in Dental Medicine

Effective Completion Date: 6/30/83 (Performance) 9/30/83 (Reports)

Grant/Contract Closeout Actions Remaining:

- [x] None Continued by E-19-522
- [ ] Final Invoice or Final Fiscal Report
- [ ] Closing Documents
- [ ] Final Report of Inventions
- [ ] Govt. Property Inventory & Related Certificate
- [ ] Classified Material Certificate
- [ ] Other _____

Continues Project No. _____ Continued by Project No. E-19-522

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Form OCA 60:1028

SECTION IV SUMMARY PROGRESS REPORT	NUMBER 5 T32 DE07053-08	
PROGRAM DIRECTOR (Last, First, Initial) Hochman, Robert F.	PERIOD COVERED BY THIS REPORT FROM 7/1/82	THROUGH 6/30/83
NAME OF ORGANIZATION Georgia Institute of Technology		

TITLE OF PROGRAM (Repeat title shown in Item 1 on first page)

Graduate-Postdoctoral Training in Dental Materials

1. Describe accomplishments since last report. Describe the significance of any changes in the direction taken by the program during this period.

2. Publications pending or published and not previously reported? ☐ No ☒ Yes If "Yes," list below.

3. Foreign travel undertaken during the above period? ☒ No ☐ Yes If "Yes," describe below.

1. Accomplishments

During this period, Mr. Richard Pike, predoctoral, settled on his thesis research which is in the area of developing casting methods for high temperature (corrosion resistant and biological resistant) metals and alloys. The function of this study is two-fold: to develop an induction susceptor to maintain a relatively clean environment in which induction vacuum melting can be accomplished with such high melting materials as zirconium, niobium and their alloys. The second part of this program is the development of non-reactive refractories for casting dental-biologically useful shapes since these metals are generally cast into water-cooled copper mold at present. These metals were tentatively shown to be quite resistant to the reaction of biological environment. Further studies are being conducted in conjunction with Dr. Myron Spector who is now on the staff of Emory University and working with us to verify the oral and biological acceptability of zirconium and niobium in conjunction with our newest graduate predoctoral trainee, Mr. S. Hedayat.

Dr. Brent Carter (Ph.D in physics) joined our program to provide an area of training and an area of study in biomedical surfaces and interfaces. Dr. Carter's main interests and areas have been in surface analysis techniques using Auger, Scanning Auger, Scanning Ion Microscopy and Electron Emission Spectroscopy. These high powered surface analysis techniques will allow one to look at a few atomic layers and determine precisely what is occurring on surfaces at the dental-biological-material interface. Of course such work takes in-depth analysis to set up the standards and long-term development. Therefore, Dr. Carter is presently dealing with both surfaces in dental alloying materials and examining various reactions in high-copper alloy dental amalgam. Preliminary results indicate some extremely interesting variations on the ultra-microstructure chemistry versus those normally considered. In addition, Dr. Carter is serving as instructor for other trainees in these significant techniques. He is also developing an initial program to submit to NIDR for further in-depth research studies in this area. Without a doubt, the metal-biological interface on an atomic scale is far from understood and this work is not only interesting but extremely necessary to the development of a better understanding

(See next page)

of the restoration-biological interface. This could also lead to determining modifications at this interface to produce desired oral and biological properties. Dr. E. Meletis has been working with the characterization of environmental interaction with materials to improve their application in the dental-biological environment. Basic studies on face centered cubic metals in relation to corrosion and stress corrosion have been the subject of his major effort.

During this period, Dr. Antonio Valezco has joined the program and is working in dental-biological implants of polymer-graphite composites. This work is being done in cooperation with the grant director and under the direction of Dr. Myron Spector. This work is aiding in establishing a cooperative program between Emory University and Georgia Tech. In fact, it has led to a cross-appointment program whereby Dr. Myron Spector spends portions of time at Georgia Tech and I (R. F. Hochman) work on various dental-biological programs for Emory University here at Tech. Further cooperation with Emory staff includes Dr. Steven Reese, D.D.S., one of our recent trainees, who is now an assistant professor on the Emory University Dental School staff.

More recently two additional trainees have been added to the program, Dr. John Rinker and Dr. Roy Crooks who are initiating studies in further basic metallurgical techniques applying them in depth to dental material problems.

All in all it has been a rewarding program year particularly from the training standpoint and at this time the training grant is fully staffed with a maximum number of pre- and postdoctoral candidates.

II. Publications During the Period

E. Meletis and R. F. Hochman, "Techniques for Determination of the Crystallographic Characteristics of Environmentally Induced Brittle Fractures", submitted for publication to SCRIPTA METALLURGICA (1982).

E. Meletis and R. F. Hochman, "Crystallographic Characterization of Transgranular Stress Corrosion Cracking of Face Centered Cubic Metals and Alloys", submitted for publication to CORROSION SCIENCE (1982).